

## C – Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

Claim 15-27. (deleted):

28. (currently amended) A method of determining the parameters  $R_t$ ,  $R_{x0}$ , and  $d_i$  of formations comprising multiple layers and through which a borehole passes, on the basis of a resistivity log recorded in the borehole by means of a measuring and recording tool, the method comprising the steps of:

- (i) determining the boundaries between said geological layers;
- (ii) selecting homogeneous observable magnitudes for each geological layer, based on the recorded log;
- (iii) determining for each geological layer pseudo-parameters by a quasi-Newton inversion method implemented on said observable magnitudes;
- (iv) computing the physical magnitudes  $R_{x0}$ ,  $R_t$  and  $d_i$  from said pseudo-parameters ~~determining the formation parameters by a quasi-Newton parameter inversion method implemented on pseudo-parameters that are homogeneous and that are determined from the formation parameters taken simultaneously over all the layers of formations so as to obtain a model of the formations;~~
- (v) calculating the response of the tool to the model;
- (vi) using a comparison criterion for comparing the calculated response with the recorded log; and
- (vii) performing at least one new iteration if the comparison criterion is not satisfied; and
- ~~(v) determining the parameters  $R_t$ ,  $R_{x0}$ , and  $d_i$  from the calculated response.~~

29. (deleted).

30. (currently amended): A method as claimed in claim 28 29, further comprising determining the bed boundaries on the basis of points of inflection in log data.
31. (currently amended): A method as claimed in claim 28 29, further comprising selecting a bed model for each geological bed prior to implementing the quasi-Newton method.
32. (original): A method as claimed in claim 31, wherein the bed model comprises parameters concerning distance from the borehole axis so as to define radial zones about the axis, and a resistivity parameter within each radial zone defined in this manner.
33. (deleted).
34. (currently amended) A method as claimed in claim 28 33, wherein selecting the observable magnitudes includes defining a combination of data items from the log.
35. (deleted).
36. (currently amended) A method as claimed in claim 28 35, wherein the step of giving each observable magnitude a value for each geological bed comprises interpolating, within each layer, values of the observable magnitude as determined within each bed.
37. (currently amended) A method as claimed in claim 28 35, wherein each observable magnitude is given a value for each geological bed by giving the observable magnitude the value it possesses at a measurement point closest to the middle of the bed.
38. (original) A method as claimed in claim 28, wherein the step of determining parameters from log data by a quasi-Newton method is performed by estimating the Jacobian of the problem by Broyden's method.
39. (original) A method as claimed in claim 28, wherein the log used is an  $R_{LLS}$  and  $R_{LLd}$  log.
40. (original): A method as claimed in claim 28, wherein the log used is an  $R_{LAI}$ , ...,  $R_{LA5}$  log.